INVESTIGATION INTO THE LOSS OF PYRANOL AT THE MONROE POWER PLANT

ENGINEERING RESEARCH DEPARTMENT
SERIAL REPORT 75E21-2

THE DETROIT EDISON COMPANY

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INTRODUCTION

1.1 On October 14, 1975, the Engineering Research Department was notified by Environmental Affairs that a loss of pyranol transformer fluid containing polychlorinated biphenyls (PCB) had occurred at the Monroe Power Plant Transformer House. Engineering Research Department undertook a program of sampling and analysis in cooperation with the Production Department and Environmental Affairs. In all, about 250 samples of soil and water have been taken of which three-quarters were analyzed by Engineering Research Department of Detroit Edison.

1.2 Because Engineering Research Department lacked gas chromatographic instrumentation with the required sensitivity to determine PCB in the parts per trillion concentration range, it was necessary to engage other laboratories for this phase of the program. The laboratories chosen were Encotec and ERG.* Discussed in this report are sampling rationales, analytical methods, analytical results, and the interpretation of these results.

*Encotec is Environmental Control Technology Corporation, 3983 Research Park Drive, Ann Arbor, Michigan 48104. ERG is Environmental Research Group, Inc, 313 North First, Ann Arbor, Michigan 48107.

Soil Samples

2.1 There were two purposes behind the sampling program. Firstly, to determine the concentration of PCB in the areas where leakage was suspected to have occurred. Secondly, to determine the background concentrations of PCB in areas remote from the incident. Each case will be covered in turn.

2.2 Three main areas were sampled. The first area was just north of the Tractor House where the barrel of pyranol was stored when the leak was discovered. Later the soil was excavated leaving a hole 10 feet wide, 12 feet long, and 4 feet deep. In all 23 samples consisting mainly of sand and gravel were taken from this excavation for analysis of PCB. The other two areas were where the oil sorbent material had been inadvertently discarded after its use in the Tractor House. Because of the necessity for equipment to be moved in and out of the building, the area to the east was excavated leaving the west area open to traffic. The east area excavated was 35 feet wide by 28 feet long by 0.5 foot deep. Thirty-three soil samples were taken from this area after excavation for analysis of PCB. Six soil samples were taken from the west area. In general, the samples were an oily granular soil containing many large rocks. Because of the almost continuous movement of large heavy equipment in and out of the Tractor House, the soil had been compressed and solidified to a near asphalt-like consistency making sampling extremely difficult.

2.3 The second type of samples were collected to determine background PCB concentrations. [illegible] In all, 15 samples were obtained for analysis to determine background concentrations of PCB. Samples were obtained both on the plant site and 1-2 miles from the plant site.

2.4 Samples were collected from the containers in which the soil was stored after excavation. Two core samples were obtained from each 6 cubic yard container, three core samples from each 9 cubic yard container and 10 core samples from each 20 cubic yard container. The core samples from each container were combined, split, and two aliquots analyzed from each container. In all, a total of 90 cubic yards of soil was removed from the excavated areas.

2.5 In addition to the soil samples taken as outlined above, other samples were taken during the drilling of a series of monitoring wells in the vicinity of the Tractor House. These samples were obtained at various depths during the drilling process. The interpretation of the results of the chemical analysis will be submitted by the hydrology consultants, Dames and Moore.

Much of the hydraulic fill material deposited at and near the tractor house consisted of dredge material from the River Raisin. The Michigan Dept. of Nat. Resources has found that the river sediments are contaminated with PCB's